R E P O R T R E S U M E S

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STATE OF NEW YORK STANDARD SCHOOL PLAN TYPE C-1, ONE-STORY SENIOR HIGH SCHOOL 800 EXPANDABLE TO 1000 PUPILS.
NEW YORK STATE DEPT. OF PUBLIC WORKS, ALBANY
CHAPMAN, EVANS AND DELEHANTY, NEW YORK, N.Y.
EDRS PRICE MF-$0.25 HC-$1.60 38P.

DESCRIPTORS- *SCHOOL DESIGN, *SCHOOL LOCATION, *SENIOR HIGH SCHOOLS, FALLOUT SHELTERS, PHYSICALLY HANDICAPPED, SCHOOL CONSTRUCTION, SCHOOL EXPANSION, SCHOOL SPACE, TEAM TEACHING,

THE PROGRAM FOR A SENIOR HIGH SCHOOL FACILITY REQUIRED A ONE-STORY BUILDING FOR 800 PUPILS WITH THE POTENTIAL FOR ACCOMMODATING AN INCREASE OF 200 PUPILS. EMPHASIS WAS TO BE PLACED ON SATISFYING THE VARYING SITE CONDITIONS WITHIN THE STATE. SITE VARIATION IN TERMS OF--(1) ACCESS, (2) TOPOGRAPHY, (3) ORIENTATION, AND (4) SOIL CONDITIONS SUGGESTED EXPRESSION OF MAJOR ELEMENTS IN AN OPEN PLAN. THE FIVE BASIC FUNCTIONAL UNITS ARE--(1) AUDITORIUM AND SHOPS, (2) GYMNASIUM AND CAFETERIA, (3) SCIENCE CLASSROOMS, (4) LIBRARY AND TEAM TEACHING, AND (5) GENERAL STUDIES. THE CONSEQUENT INTEGRATION OF ELEMENTS PROVIDES CLOSE STUDENT-TEACHER CONTACT WITH A MINIMUM OF CORRIDORS AND THE PROVISION OF OUTDOOR TEACHING SPACE. INCLUDED AS PROJECT CONSIDERATIONS ARE--(1) PROVISIONS FOR THE PHYSICALLY HANDICAPPED, (2) MODULAR DRAFTING DATA, (3) STRUCTURAL CRITERIA, (4) MECHANICAL SYSTEMS DATA, (5) BUILDING MATERIAL SUGGESTIONS, AND (6) FALLOUT PROTECTION DATA. A FLOOR PLAN AND PERSPECTIVE ARE INCLUDED. (MH)

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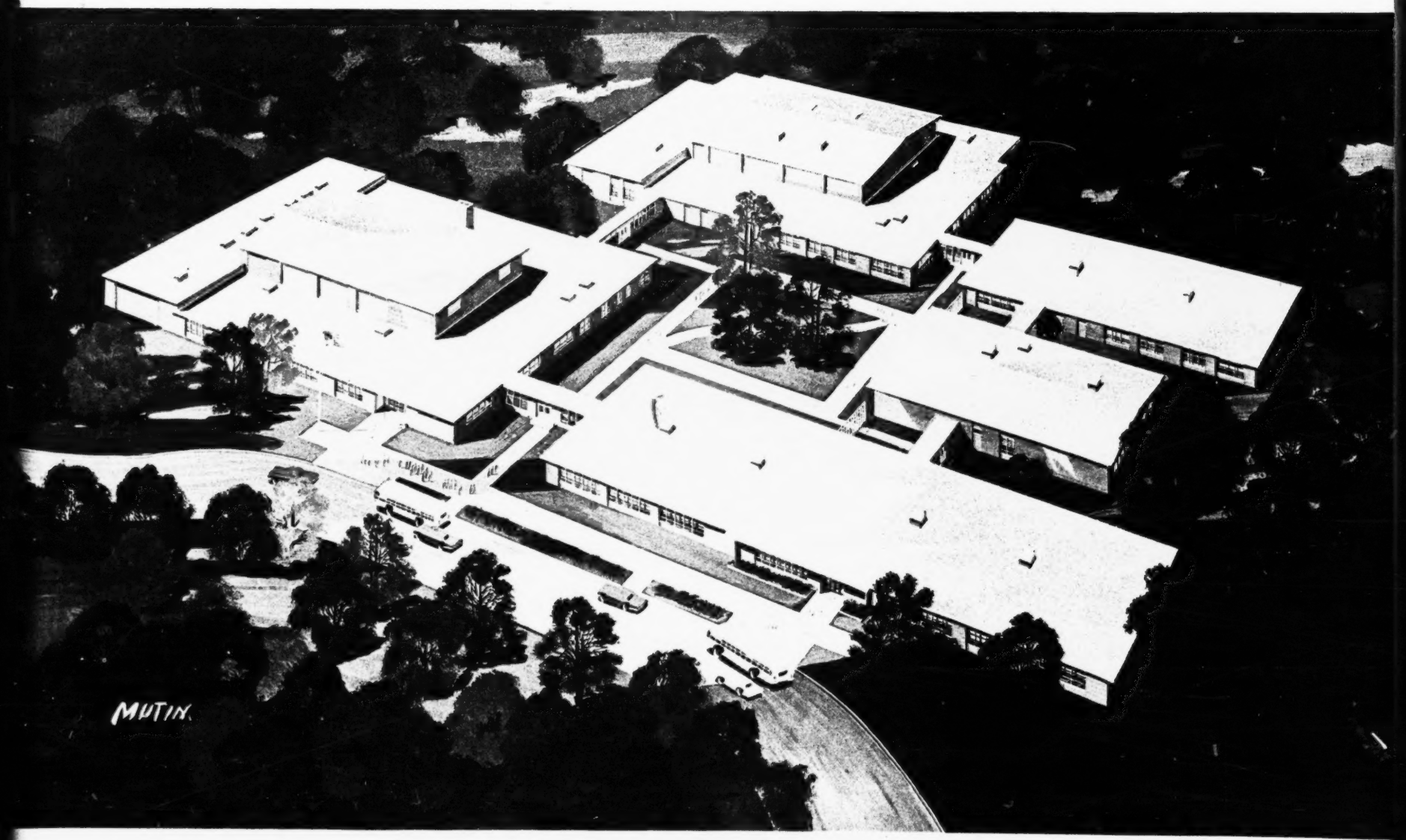
STATE OF NEW YORK
STANDARD SCHOOL PLAN
TYPE C-I



EXPANDABLE SENIOR HIGH SCHOOL 800 TO 1000 PUPILS

EF0004I6

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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STATE OF NEW YORK

STANDARD SCHOOL PLAN

TYPE C-1, ONE-STORY

SENIOR HIGH SCHOOL

800 EXPANDABLE TO 1000 PUPILS

-REPORT-

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PREFACE

The Architectural problem presented by the state program for the Type C-1 school was to design a one- story building to house a Senior High School population of 800 pupils, utilizing the following suggested space requirement schedule provided by the University of the State of New York, the State Education Department, Division of School Buildings and Grounds. The design will accommodate an additional expansion of 200 pupils and takes into consideration, to the greatest extent possible, the varying site conditions found in New York State.

The primary factory influencing the plan and overall design layout is the possibility of adapting a Standard School Plan to an almost unlimited variety of sites from the standpoint of access, topography and climatic conditions.

EDUCATIONAL FACILITIES AS PROVIDED IN PLAN TYPE C-1

These correspond satisfactorily to the recommendations of the State Education Department, and as modified in conference with other educational and architectural advisors.

TEACHING SPACES

No.	Title or Use	Comments
2	Industrial Arts	Storage for each
2	Homemaking	
3	Science	Preparation & storage
2	Classrooms	Future Science
1	Art	
1	Drawing	
1	Classroom	Adult Education
3	Business Education	
1	Instrumental Music	3 Practice Rooms
1	Choral Music	
16	Classrooms	Varying in Size
1	Double Classroom	Team Teaching
1	Library	Related Areas
1	Study Room	
1	Double Gymnasium	Showers-Lockers
1	Auditorium	Capacity 612

FOR FUTURE EXTENSION

2 Classrooms

2 Science

1 Agriculture Shop & Recitation Room

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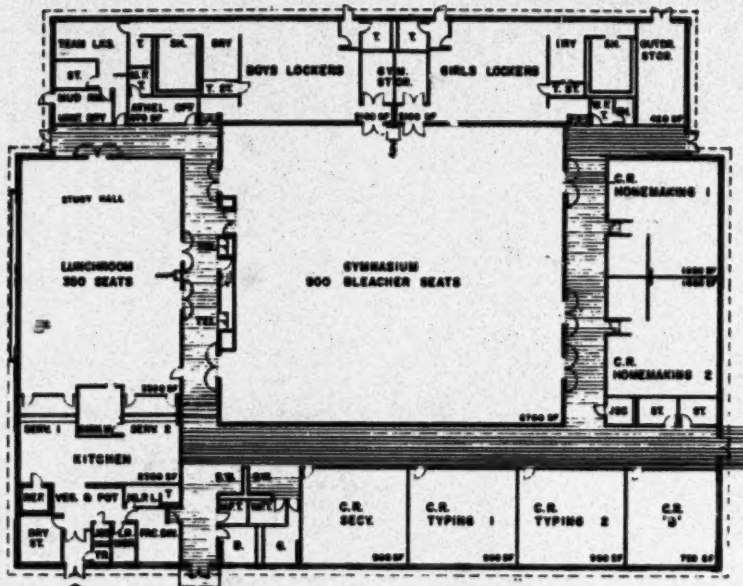
ADMINISTRATIVE, PERSONNEL & COMMUNITY SPACES

No.	Title or Use	Comments
1	Administration	Suite
1	Health	Suite
1	Student Activity	
1	Guidance	Suite
1	Cafeteria	Study Hall
1	Kitchen	Related Areas
2	Teachers Rooms	
1	Faculty Dining Room	
1	Conference	

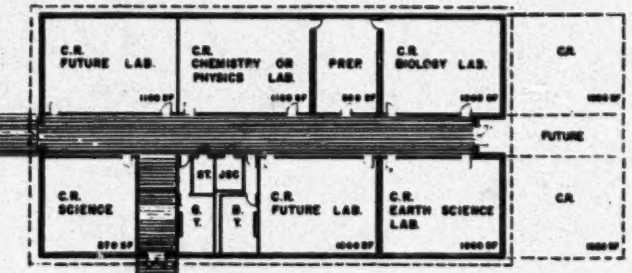
DUAL USE SHELTER AREA

2 Toilets
1 Generator Room
1 Body Mechanics Area
1 Community Activities Area
6 School Club Rooms
1 Meeting Room
1 Conference Room
1 Food Storage

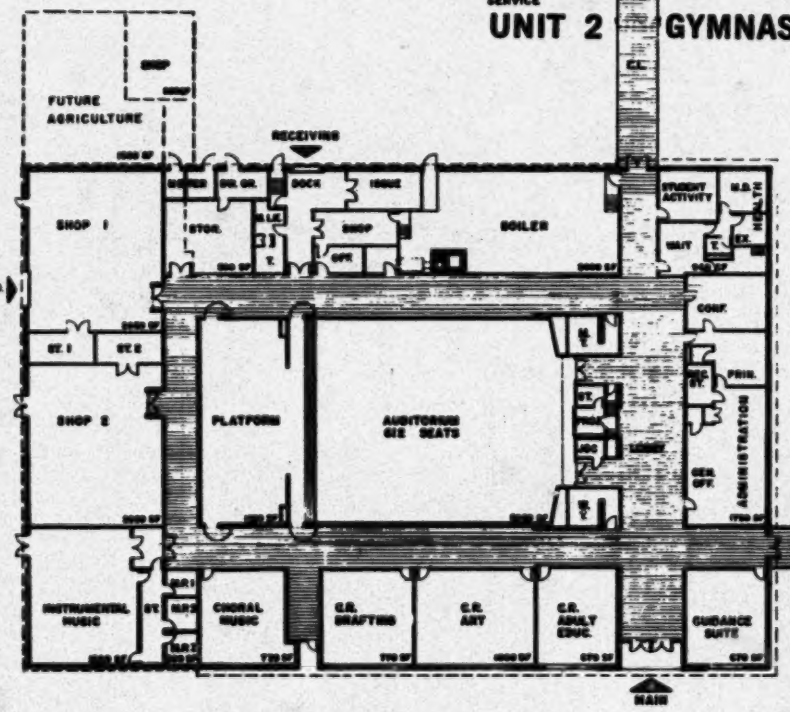
NOTE: The areas of all spaces noted above can be found in the floor plans.



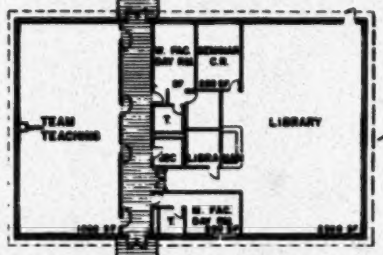
UNIT 2 GYMNASIUM & CAFETERIA



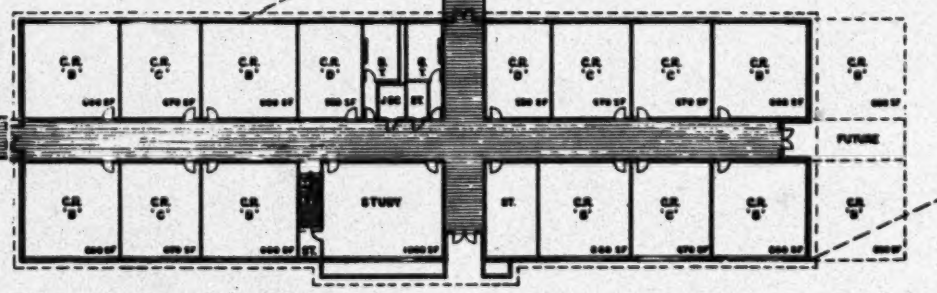
UNIT 3 SCIENCE CLASSROOMS



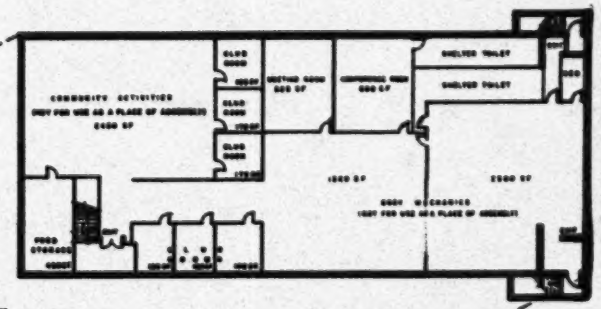
UNIT 1 AUDITORIUM & SHOPS



UNIT 4 LIBRARY & TEAM TEACHING



UNIT 5 GENERAL STUDIES



DUAL — USE BASEMENT FALLOUT SHELTER AREA
SHELTER CAPACITY 1000 PERSONS

GRAPHIC SCALE IN FEET

16 0 16 32

REPORT: N.Y.S. STANDARD SCHOOL TYPE C-1

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GENERAL DESIGN

The first approach of the architects in the design of this high school was in the direction of a single unit arranged to house all the elements for the school as set forth in the program. Almost immediately it became evident that such a single unit or mass of buildings would cover far too much land and afford access from too few directions or in too limited areas. Contours of lot, orientation of elements, access roads and types and condition of soil each seemed to direct and lead to an open plan made up of more flexible units; variable in size, orientation and structural treatment. So it was that the major elements of the plan were analyzed, and related functions brought together in a series of five basic units.

Unit 1 - Auditorium and Shops. Also included in this element of the plan are areas more generally used by adults than by the student body in their normal daily activity. Here are located the Administration and Health Department as well as Group Guidance Adult Education, Arts and Music. Shops and Band Practice Room are located well away from other activities, but adjacent to the Platform of the Auditorium. Receiving, Custodial facilities and Boiler Room are also included in this element of the plan with readily available access.

Unit 2 - Gymnasium and Cafeteria. Here is located not only the Gymnasium including locker rooms, but Cafeteria, Kitchen and related facilities. A Faculty Dining Room is included in this plan as well as special classrooms, secretarial, typing, and homemaking laboratories.

Unit 3 - Science Classrooms. This unit is made up of all science laboratories, including chemistry, physics and biology, as well as special science classrooms and laboratories for the earth sciences. It is recommended that the expansion area for laboratories and classrooms be provided at the open end of this unit.

Unit 4 - Library and Team Teaching. This unit should be related to and situated near both the Science Classrooms described above, and Unit 5, General Studies. In Unit 4, in addition to the Library, there is a large double room for Team Teaching with folding partitions for more flexible use. It is in this unit that both male and female Faculty Day Rooms are located.

Unit 5 - General Studies. This element is made up of 14 classrooms for general studies. It is suggested that this unit be located as near as possible to the most favorable point of approach and as indicated on the submitted plan, near both the Auditorium and Shops, Unit 1, as well as Unit 4, Library and Team Teaching. Here is afforded the best opportunity for additional classrooms to fulfill the requirements for expansion from the basic 800 to 1,000 students.

Report - New York Standard School - Type C-1

It is the aim of this program to further the construction of economical educational facilities throughout the state by making available to local School Boards basic standard school plans for adoption by their own Architects. The plans have been prepared to provide the maximum flexibility in their function as a background for the educational program as established by the local Board. Methods of teaching will vary with each community and the plan must be arranged to accommodate such methods. Consequently, the designing Architects have established a basic plan in which room size may be increased or decreased as the size of classes are established. Provision may be made for closed circuit television to be brought to each classroom area by the installation of an open conduit system as directed by the School Board. Actual connections are to be installed under the direction of the adapting Architect.

There is now provided one large room situated in Unit 4 "Library and Team Teaching." This area may be divided by the folding partition indicated on the plans. Should the program for "Team Teaching" be expanded, other classrooms could be so treated by the removal of the masonry partition and the use of more folding or movable divisions.

In general, the plan provides for a thoroughly integrated Senior High School with all related elements well ocated in five separate units of the plan to establish an intimate feeling between

students and teachers and yet provide the minimum in required circulation through the corridors.

A unique feature of this plan is the provision for outdoor teaching areas. These are easily made available adjacent to the connecting corridors between the several units of the plan.

Although it is felt that the relation of elements or units of plan as shown on the finished drawings is the best, it is possible to achieve a great degree of flexibility to satisfy site requirements.

On the following pages are suggested alternate plan arrangements utilizing the same units as those shown on master plan.

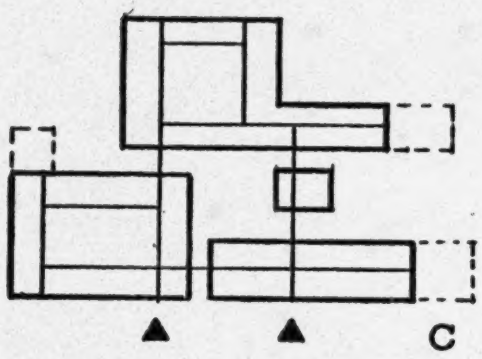
A. Provides for varied elevations of site in direction of main axes of plan. Connection between main units could be ramped or stepped.

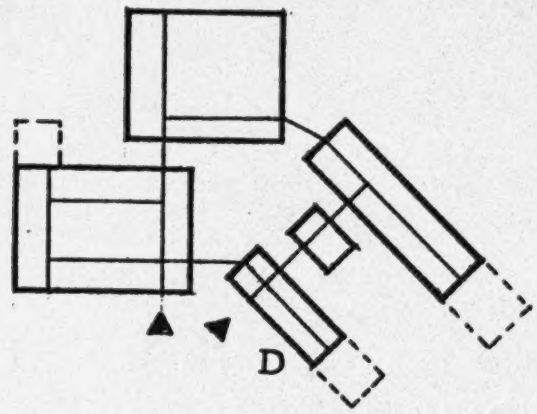
B. More compact plan adaptive to comparatively flat lot. In this plan the library became a feature readily accessible to the public.

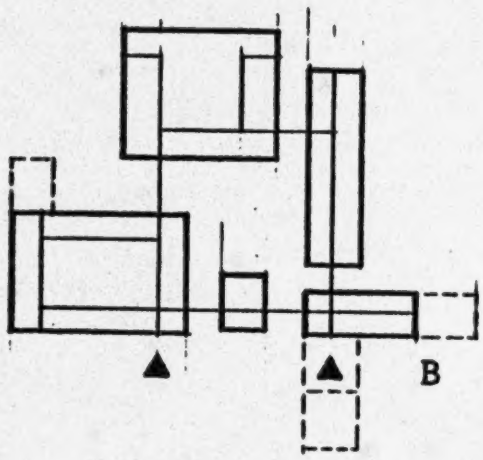
C. For shallow and compact treatment.

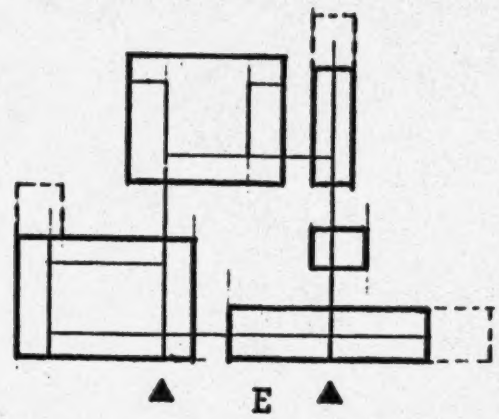
D. Similar basic plan but shown possibility of adjustment to contours.

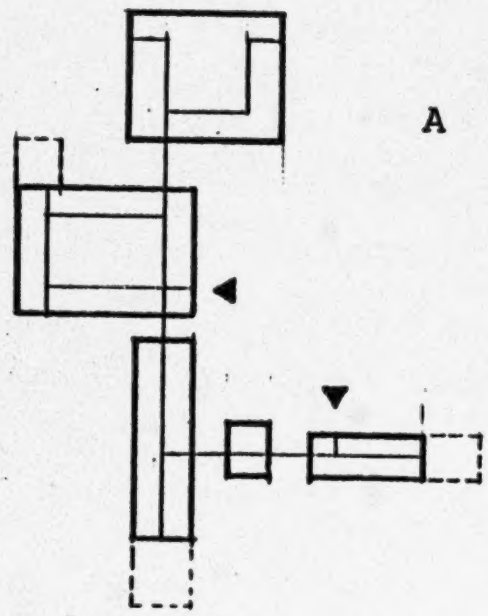
E. Similar to "B" generally suitable for level or slightly slopping site with Library more closely related to academic activities.











ALTERNATE ARRANGEMENT
FOR
STANDARD SCHOOL PLAN
TYPE C-1

PROVISIONS FOR FALLOUT PROTECTION

The dual use fallout shelter included in this school was developed by the D.P.W. in cooperation with the Education Department and can be utilized in a variety of ways to augment the school program and the affairs of the community. Suggested functions which the shelter space might serve are: meetings of scouts groups on all age levels, meetings of other community organizations and school purposes such as student government quarters, publications rooms, recreation, areas for a variety of remedial purposes, administrative offices, large group instruction and audio-visual activities.

The plans for the shelter are architecturally and mechanically complete with the exception of the structural design for the sub-grade work. This work is to be completed by the adapting architect to meet whatever the existing soil conditions might be.

The size of shelter space, the capacity of the mechanical systems, and the provisions for food and water storage are based upon the expanded capacity of the school with a proper allowance for teachers and staff. Any special conditions which will affect the capacity of the school will require changes in these factors of the fallout shelter design.

The location of the shelter under the building was made to obtain the best protection at the lowest possible cost. A change in the location of the shelter will necessi-

tate additional shielding design. Shielding has been obtained by both separating with distance and with mass, the planes on which radioactive particles will rest in relation to the shelter area. It is to be noted that any dimensional or material changes in the area above the fallout shelter may effect the shelter design. For this reason the minimum mass of the interior partitions, floor construction, and total overhead construction upon which the shelter calculations have been based are indicated on the drawings. If materials of lesser mass than the tabulated values are used redesign of shelter will be required. It also has been assumed in the calculations, that finish grade is never below the bottom of the first floor slab around the shelter area. It is, therefore, necessary to maintain this grade in order to avoid redesign of the shelter.

The shelter plan indicates emergency water supply in a group of tanks within adjacent crawl space. Wherever an adequate supply of well water can be obtained it is suggested that the adapting architect substitute it as the fallout shelter water supply. The plans show self-contained toilet facilities in the form of sanitary tanks fitted with toilet seats. Wherever a septic tank and leaching field are available and the supply from the well is adequate, it is suggested the adapting architect substitute a system using periodic flushing of waste. Generator capacity should be checked, however, to be sure that an adequate power supply is made available, during the emergency period, for these possible substitutions.

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The shelter area is designed for a minimum protection factor of 100 by use of "Design and Review of Structures for Protection from Fallout Gamma Radiation", and official Office of Civil Defense, Department of Defense Publication. In this respect it meets requirements of the New York State Civil Defense Commission.

Any changes to the shelter as specified and shown on the drawings should be discussed with and approved by the New York State Civil Defense Commission.

PROVISION OF FACILITIES FOR PHYSICALLY HANDICAPPED

In the development of the plans for Standard School Type C-1, all basic facilities for handicapped have been included. Such facilities include a wheelchair toilet stall and lavatory for boys with the same provisions for girls. These as well as all other facilities are located on the basic floor level as Type C-1 indicated this is but a one-story building. A special 30" high drinking fountain is also provided.

Ground level entranceways with door wide enough and operable for a wheelchair are indicated on the plans.

Ramps in connecting elements may be used by the adapting architect where changes in grade elevation so require.

MODULAR DRAFTING

The plans for Standard School Type C-1 have been developed in accordance with the five fundamentals of Modular Drafting. Modular Drafting was selected as the most practical standard, economical in practice for the architect and easy of interpretation by the Contractor. The five basic rules are:

1. If you make use of one or more design - modules in laying out the building, be sure that they are multiples of four inches, such as 16", 40", 7'-8", 20'-0" and so on.

2. When you put dimensions on a Modular detail, locate the surfaces of parts, centerlines, etc., by dimensions to the gridlines shown not to points elsewhere in the building. It should be noted that a Modular detail needs fewer small fractional dimensions then does a detail drawn the old way.

3. On small scale layout drawings; plans sections and elevations, give nominal or grid dimensions.

4. Whether at large scale or small, whether the grid is drawn in or not, always use an ARROW when dimensioning to a gridline. When dimensioning to a point off the grid use a DOT.

5. Vertical Dimensions are coordinated by the final rule of Modular Drafting, which fixes floor heights as follows:

In this project the nominal finished floor is a gridline; actual finished floor is located 1/8" below gridline, with one exception --

> In wood-frame construction, the top of the sub-floor or of slab-on-ground coincides with a gridline.

EXPANSION

Areas of expansion are recommended for the ends of both the Science Classrooms and General Studies Units so that construction will not interfere with the operation of the School. Adequate toilet facilities have been provided in each unit to allow for such expansion. An equally important design criteria in considering expansion is that the pupil population of the school will be maintained at approximately an equal ratio of male and female students. In unusual circumstances the supervising architect or local representative for the Board of Education may wish to alter the s anitary facilities to provide for a different ratio.

The structural system as designed for the original building may be repeated by the local or adapting architect without extensive changes due to the standardized materials and methods used.

BUILDING MATERIALS

The determining factor in the selection of materials was that such materials as were specified, would be available in a fully competitive market in every part of the State, and that local craftsmen would be completely familiar with the methods and manner of installation.

For exterior walls, brick is specified. Recesses in walls are indicated above and below windows. This anticipates the alternative that the local supervising architect will want to use a different color, or perhaps a glazed brick of high color quality. It is also possible that in these recesses he may wish to substitute terra cotta spandels and lintels for a change in texture and a pleasant color contrast.

Windows are shown in aluminum with fixed glass panels above hopper vents at sills. It is suggested that, by choice of the School Board, similar windows of wood may easily be substituted. Local mills and lumber dealers tend to carry standard stock lines of such wooden windows, or at least have them readily available through manufacturer's representatives.

All roofs are shown and specified to be built up 20-year bonded with gravel finish. Other finish may well be substituted depending on local conditions. White marble chips, slag and

even granite or Blue stone screenings could be used.

Soffits of overhangs are called for to be of cement asbestos board; although here again, substitution of other materials are possible. Cement plaster on expanded metal lath or tongued and grooved wood siding might be found desirable.

Interior partitions are shown as concrete block. Another very good and satisfactory partition could be obtained by the use of steel studs with rock lath or expanded metal lath and plaster.

Finished floors are specified in general to be asphalt tile, with vinyl asbestos tile in corridors. Kitchen floor and base will be quarry tile and all toilet rooms vitrious clay tile. Wood floors are specified for gymnasium and platform in Auditorium.

The above description outlines the principal materials to be used, but detailed information in connection with all materials and their installation is included in the specifications. It shall be noted that whereas definite recommendations are included, it is the privilege of any School Board to elect and direct their local representative to substitute material of their own choosing. In certain cases such substitutions may prove of substantial economic benefit to the taxpayer without materially influencing the quality of the structure.

Certain of the materials specified were selected as the most economical available for the intended use, within the limits of a proper minimum standard of good practice. However, where local budgets allow, the adapting architect is advised to consider the use of substitute materials which will offer possibly greater economies in long-term performance and maintenance.

Attention is particularly directed to the following specific items:

1. The use of ceramic glazed wall and floor surfaces in lieu of vitreous enamel surfacing in showers and drying areas, service closets, and similar spaces, as well as on wall surfaces of corridors.
2. The use of enameled steel or glass chalkboards in lieu of composition chalkboards.
3. Substitution of an aluminum window with heavier extruded sections to ensure greater dimensional stability and rigidity over a prolonged period of use.
4. The inclusion of acoustical hung ceilings in Typing Classrooms and similar spaces.
5. Such changes to wall and floor surface finishes in the Lobby as are deemed appropriate by the adapting Architect in order to provide a more easily maintained place of public assembly and to enhance the appearance of the space.

STRUCTURAL DESIGN

The program requirements suggest that this school shall be a one story building. The basic structural plans now call for a concrete slab on fill, except for Unit 5, which has a free standing reinforced concrete slab in order to accomodate the fallout shelter below. Requirements of the mechanical trades are generally accomodated in ceiling spaces, with a pipe tunnel provided under the connecting elements. The weights imposed at each supporting point are indicated on the plans and it shall be the function of the supervising architect to determine the size and type of foundation to be used in providing for such loads.

In the event that variations in grade levels at the site, or variations in the bearing capacity of the soil throughout the area of the building, make a slab on fill impractical, it will be possible at the discretion of the Board of Education and their local representative to design for a free standing reinforced concrete slab throughout.

The design of the superstructure is based on an independent structural steel frame. This system provides maximum flexibility and economy. In special cases of long span requirement, open

web steel joists are called for in place of conventional rolled sectional members.

Other systems were considered and unit bay designs made for comparative estimates of cost. Reinforced concrete proved too expensive in a one-story building with such long span requirements. A system using 7-1/2" deep long span steel decking, perforated for acoustical treatment, supported on 10" beams on lally columns around the perimeter and through corridor walls was also investigated. This system tended to limit the selection of roof decking and thereby influence the economy derived from more open competition in the material market.

Two types of roof deck are specified for use under the selected system. Generally where acoustical tile is recommended for finished ceilings, 1-1/2" steel decking is called for. In classroom areas 3" precast fiber concrete plank is specified. This type of plank will be left exposed and can be painted. It will provide adequate acoustical treatment for such areas.

An added advantage of the steel frame is derived from the fact that weather conditions will not delay the scheduled time of construction.

It should be noted that more and more the time element of school construction bears an important part in the selection of materials. In general, new schools must be ready September 1st,

to handle the influx of new students each year at that time. Heavy costs are incurred by failure, for whatever reason, to have new buildings ready for opening of the school year.

Any bearing wall system was immediately rejected due to the uncertainty of subsoil conditions and the almost inevitable delay in construction due to weather conditions.

The plans provide for a nonflamable material, but not a strictly fireproof building. The adapting Architects should be advised to name all necessary adjustments or revisions in connection with fireproofing steel having fireproof ceilings and other requirements which would affect insurance cost or safety requirements in his particular community.

HEATING & VENTILATING

The designs for the Heating and Ventilating systems as specified and shown on the drawings, conform to the requirements of educational standards and the State Code.

The basic design purpose is to provide a year round, positive, ventilating system, together with sufficient heating to maintain a comfortable environment in all seasons.

A design temperature of minus 20°F. has been used, to permit the school to be erected in any part of the State without re-designing the systems.

The boiler plant has been designed to burn No. 6 oil. This fuel develops approximately 150,000 BTU's per gallon, is inexpensive and readily available in all locations.

It is well to note that thermostatically operated "Sun Valves" have been provided. During periods of high solar intensity they will automatically decrease the heat output of the radiator, thereby preventing overheating.

Heating mains are to run in hung ceiling spaces except in connecting links. Heating mains in the connecting links are to run in the crawl spaces. The piping is so arranged as to permit the isolation of various sections of the piping for maintenance or repair, without affecting the remainder of the system.

In addition, capped outlets have been provided to permit future extension of the heating system, all piping has been sized to incorporate this future load.

Individual ventilating units have been used in the classrooms. They provide local control of both the ventilating and the heating, while eliminating expensive ductwork, fans, etc. The units in certain designated areas have been provided with day-night thermostats, which will enable a particular room to be maintained at a higher temperature than the remainder of the system during normally inactive hours. The "warm-up time" will be cut down and the normal heating and ventilating cycle restored at will, while the unused classrooms are maintained at a lower temperature.

Toilet areas, Locker Rooms, Kitchen, etc., are provided with the required exhaust ventilating systems. These systems are independent and are complete in themselves, they will remove odors and maintain a fresh air balance at all times.

Positive supply ventilating systems are provided in the Auditorium, Gymnasium, Bosy's and Girl's Locker Rooms and Lunch Room. They will provide required ventilation in highly populated areas and in addition supply tempered air to these areas for the maintenance of a constant temperature.

ELECTRICAL

The design of the electrical layout for the New York State Standard School Type C-1 was based on the requirements of the State Department of Public Works, the National Electrical Code and the recommendations of the State Education Department.

The purpose of the design was to provide comfortable levels of illumination throughout the school with added emphasis on sight critical areas (shops, drafting rooms, laboratories, etc.) as well as adequate, yet economical, service for building utilities and miscellaneous electrical systems.

The design of the electrical service incorporates a 120/208 volt, 3-phase, 4-wire system fed from a local utility transformer remote from the school through galvanized, rigid steel conduits, run underground.

The purpose of placing the transformer away from the school, was to avoid the danger of a transformer failure accidentally injuring any student in the school. In addition, code vault requirements would destroy the architectural integrity of that portion of the building by changing the roof design.

The system chosen for electrical distribution was the selective system whereby a power failure in one portion of the school would not affect the operation of other sections. Fused

switches provide maximum short circuit and over-current protection for safety as well as flexibility in isolating portions of the systems for easy maintenance. Feeders were over-sized 125% to allow for future growth.

Lighting levels generally were a compromise between the minimum recommendations of the State Education Department and those of the Illumination Engineering Society which were considered excessive. In areas where students would be operating machines unfamiliar to them or where sight was considered critical (i.e. shops, drafting and sewing rooms or laboratories) a 70 FC level was maintained. Incandescent fixtures were chosen for the shops to eliminate the dangerous stroboscopic effect inherent in the design of fluorescent unit lamps. A standard fluorescent unit was used in as many areas as possible, to reduce construction and maintenance costs. The following levels were used as criteria:

1. Classrooms - 40 FC
2. Study, Library - 50 FC
3. Storage Rooms - 10 FC
4. Corridors, Stairs - 15 FC
5. Drafting Room, Sewing - 70 FC
6. Gym - 50 FC
7. Laboratories - 70 FC
8. Auditorium - 30 FC

9.	Toilets, Lockers	- 15 FC
10.	Kitchen	- 30 FC
11.	Cafeteria	- 20 FC
12.	Shops	- 70 FC
13.	Janitor's Closet	- 5 FC
14.	Team Teaching	- 50 FC
15.	Faculty Day Work Rooms	- 40 FC
16.	Librarian Work Room	- 50 FC
17.	Quiet Room	- 20 FC

Design of the PA System included a relay tie between the speakers thereby eliminating the cost of a separate conduit system using program bells. Under an alternate clause in the specifications, the contractor is required to submit the cost of adding a relay in the PA console to allow the speakers to be used for 2-way intercommunication. The system as designed is reliable and versatile in that it can be adapted to 2-way intercommunication with ease and at only a slight additional cost.

An electronic clock system with hourly correction was used and only clock outlets were provided in each classroom. Clocks were indicated in key areas throughout the building. Under an alternate clause in the specifications, the contractor must submit a price for installing clocks where there are only outlets indicated.

A manual, non-coded Fire Alarm System is used throughout and provision has been made fore a tie between the fire alarm panel and the local municipal system. The contractor is required to furnish the cost figure for adding fire detectors in appropriate areas.

Emergency supply for selected corridor lights, exit lights, and the Public Address System will be provided by the Fall-out Shelter Emergency Generator by means of an automatic transer switch.

The conduit system specified is rigid steel galvanized throughout but can easily be replaced by electrical metallic tubing (EMT if the local school board decides that the price differential warrants it.

PLUMBING & SANITARY

The design of Plumbing and Sanitary for the New York State Standard School Type C-1 conforms to the requirements of the Division of School Buildings and Grounds as well as the State Code.

The overall Plumbing and Sanitary design purpose was to provide excellent sanitary facilities for the comfort and convenience of the pupil and teacher, and at the same time provide minimum maintenance requirements and maximum flexibility. All of the various piping systems, which a part of the whole, are designed to be easily isolated so that a local stoppage or breakdown will not cripple the entire installation. The specifications further require that contractors submit shop drawings which show and describe in detail the design, construction, capacity and operation of all equipment and/or apparatus to be supplied.

The design of the Sanitary and Storm distribution piping is such regardless of site location and type of final receivers, i.e., municipal sewers, septic tanks, leeching basins or sewage treatment plants, the piping connection thereto should be relatively simple and inexpensive.

The Sanitary and Storm drainage piping below ground and under slab within the building shall be cast iron pipe, which meets code requirements and adds strength and long life trouble

free service. Above ground, galvanized steel pipe shall be used because of lighter weight, smaller outside diameter, and ease of installation. The vent piping is to be of steel with all fixtures backvented individually, which reduces to a minimum the chances of pressure stoppages in the system and guarantees maximum fixture protection.

It would be extremely simple to substitute copper DWV pipe for this type of installation if the local shcool board so desired. The present design trend seems to be towards copper where the local codes allow. Cost should be competitive, because of less time required for installation.

The Acid Waste System is designed as an entirely separate system. A diluting basin is provided to neutralize the acid waste, before it connects to the sanitary drain from the building. The piping for the acid waste and vent system is of high strength ceramic pipe. Substitution of glass piping could be made if so desired by local authorities with a minimum of design change.

The system of Gas Piping required for laboratory, Shop No. 1 and classroom shall be made of black steel pipe. After entering the building the gas piping runs directly to the instructor's table where a master gas control valve has been located. From this master control valve the gas service is then piped to all required stations and outlets. The master control valve controls all gas outlets

within any given space and allows any gas station to be closed from an accessible central point. This is in addition to the standard closures at each outlet.

The design of the domestic Hot and Cold Water System is of non-corrosive piping, selectected for long life, easy connection and expansion if desired, and long-range economy. The piping is designed for solder type fittings and valves, making installation easy and trouble free. Exposed direct piping connections to fixture is to be brass pipe, chrome plated. A hot water circulation system provides for instant hot water at all fixtures as well as maximum efficiency and low operating cost resulting from maintaining a relatively even heating load. Thermostatic temperature controls located at the Hot Water Storage Tank in Boiler Room Area, make system a dual temperature type and allow for buildings as well as kitchen cafeteria to be supplied from a single source, thus reducing equipment load.

Plumbing fixtures in general, are of vitreous china, chair carrier supported. This type of fixture allows for hard usage and keeps floors clear for maximum sanitary conditions. The Custodian's service closet has been provided with the standard service sink in addition to a floor sink which may be used for wash cart emptying. Hot and cold water supplies have been provided

with vacuum breakers to prevent any possible contamination of potable water. Group shower areas have been provided with master thermostatic control valves in addition to individual shower controls.

All water supply lines have been insulated. The cold water with vapor barrier protection against condensation and the hot water lines for controlled minimum heat loss. Leader lines running horizontally are also insulated to prevent condensation drippings. Piping insulation will, of course, reduce operating cost as well as protect the building. All buildings have been provided with hose bibbs or wall hydrants.

The specifications require that operating and maintenance instructions covering completely plumbing equipment, controls, heaters, pumps, etc., shall be furnished to the Owner, and all automatic control devices, flush valves and other parts of the work be adjusted for quiet and proper operation.

WORK OF THE ADAPTING ARCHITECT

The Drawings and Specifications submitted herewith represent a complete design for the superstructures for this project. Design is based on an effort to make available to local School Boards a basic standard school plan incorporating the most prudent methods of construction, so that economical educational facilities will be available throughout the state.

Local School Boards will be well advised to invite the services of an adapting Architect. In the normal course of carrying such a program through to completion many aspects of the project require the services of an architectural consultant beyond the design of the superstructure. Foundation design is necessarily dependent on local soil capacities and site conditions. Loads imposed upon the supporting elements are indicated on the submitted drawings for the use of the adapting Architect in completing the foundation design after local conditions have been determined.

The adapting Architect will advise the use of substitute materials where local materials might be available at a savings to the School Board, or where more generous budgets allow the up-grading of materials specified in order to improve maintenance conditions, or to enhance the appearance of the buildings.

The protection of the School Board's interests is necessary during the receipt of Bids and the award of contracts; during the construction period for checking shop drawings for conformance to specifications; for supervision during construction (either continuous or periodical), and for a final inspection at the completion of the project.

Connections to utilities and services outside the buildings, as well as certain required site development and landscaping, is work which will require the consultation of an adapting architect.

The proper utilization of the Standard School Plans will result in better and more economical educational facilities.

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